# **Crocodile Write-up**

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# Introduction

Tier I is all about exploitation vectors that chain together to offer you the possibility of gaining a foothold on the target from one service to another. Credentials could be lost somewhere in a publicly accessible folder which would let you login through a remote shell left untended and unmonitored. A misconfigured service could be leaking information that might allow you to impersonate the digital identity of a victim. Any number of possibilities exist in the real world. However, we will start with some simpler ones.

Tackling an example sewed together from two other previous targets, we will be looking at an insecure access configuration on FTP and an administrative login for a website. Let us proceed to deconstruct this vector and analyze its' components.

### **Enumeration**

We will start by enumerating the target. Our first step is, as always, a thorough nmap scan. By using the following two switches for the scan, we ensure that our nmap script analyses the service being run on any port found in the open state and returns a mostly exact service version value in the output and that all of the default analysis scripts are run against the target, as we are not constrained on how intrusive we can be with our scan. Running the scan as mentioned, we can receive results as seen below, with snippets of directories the scan has even found for us!

-sC: Performs a script scan using the default set of scripts. It is equivalent to -script=default. Some of the scripts in this category are considered intrusive and should not be run against a target network without permission.

-sV: Enables version detection, which will detect what versions are running on what port.

```
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$ sudo nmap -sC -sV {target_IP}
Starting Nmap 7.91 ( https://nmap.org ) at 2021-07-09 11:48 CEST
Nmap scan report for {target_IP}
Host is up (0.21s latency).
Not shown: 998 closed ports
PORT STATE SERVICE VERSION
                   vsftpd 3.0.3
21/tcp open ftp
| ftp-anon: Anonymous FTP login allowed (FTP code 230)
             1 ftp ftp 33 Jun 08 10:58 allowed.userlist
 -rw-r--r--
               1 ftp
                                        62 Apr 20 11:32 allowed.userlist.passwd
  -rw-r--r--
                          ftp
 ftp-syst:
   STAT:
  FTP server status:
      Connected to ::ffff:{user_IP}
      Logged in as ftp
      TYPE: ASCII
      No session bandwidth limit
      Session timeout in seconds is 300
      Control connection is plain text
      Data connections will be plain text
      At session startup, client count was 2
      vsFTPd 3.0.3 - secure, fast, stable
 End of status
<u>80/tcp open http</u>
                    Apache httpd 2.4.41 ((Ubuntu))
|_http-server-header: Apache/2.4.41 (Ubuntu)
[_http-title: Smash - Bootstrap Business Template
Service Info: OS: Unix
Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP addess (1 host up) scanned in 11.67 seconds
```

We have two open ports: 21 and 80. Port 21 is the port dedicated to FTP (File Transfer Protocol), meaning that its' primary use is to transfer files between hosts on the same network.

According to Wikipedia, a quick reminder:

The File Transfer Protocol (FTP) is a standard communication protocol used to transfer computer files from a server to a client on a computer network. FTP users may authenticate themselves with a clear-text sign-in protocol, generally using a username and password. However, they can connect anonymously if the server is configured to allow it.

Users could connect to the FTP server anonymously if the server is configured to allow it, meaning that we could use it even if we had no valid credentials. If we look back at our nmap scan result, the FTP server is indeed configured to allow anonymous login:

If you need a refresher, the ftp -h command will help you figure out the available commands for the FTP service on your local host.

\$ ftp -h
\$ ftp -h
Usage: { ftp | pftp } [-46pinegvtd] [hostname]
 -4: use IPv4 addresses only
 -6: use IPv6, nothing else
 -p: enable passive mode (default for pftp)
 -i: turn off prompting during mget
 -n: inhibit auto-login
 -e: disable readline support, if present
 -g: disable filename globbing
 -v: verbose mode
 -t: enable packet tracing [nonfunctional]
 -d: enable debugging

To connect to the remote FTP server, you need to specify the target's IP address (or hostname), as displayed on the Starting Point lab page. The prompt will then ask us for our login credentials, which is where we can fill in the anonymous username. In our case, the FTP server does not request a password, and inputting the anonymous username proves enough for us to receive the 230 code, Login successful.



Once logged in, you can type the help command to check the available commands.

### - - -

### ftp> help

Commands may be abbreviated. Commands are:

!	dir	mdelete	qc	site
\$	disconnect	mdir	sendport	size
account	exit	mget	put	status
append	form	mkdir	pwd	struct
ascii	get	mls	quit	system
bell	glob	mode	quote	sunique
binary	hash	modtime	recv	tenex
bye	help	mput	reget	tick
case	idle	newer	rstatus	trace
cd	image	nmap	rhelp	type
cdup	ipany	nlist	rename	user
chmod	ipv4	ntrans	reset	umask
close	ipv6	open	restart	verbose
cr	lcd	prompt	rmdir	?
delete	ls	passive	runique	
debug	macdef	proxy	send	

We will use dir and get to list the directories and manipulate the files stored on the FTP server. With the dir command, we can check the contents of our current directory on the remote host, where two interesting files catch out attention. They seem to be files left over from the configuration of another service on the host, most likely the HTTPD Web Server. Their names are descriptive, hinting towards a possible username list and associated passwords.



Both files can easily be downloaded using the get command. The FTP service will report the download status completion back to you during this phase. It should not take long to have them both sitting snuggly on your attacking VM.



Termination of the FTP connection can be done by using the exit command. This will return the current terminal tab to its' previous state.



Immediately after exiting the FTP service shell, we can type in the **1s** command to check if our files are present in the directory we were last positioned in. In order to read their contents and discover and usernames and passwords within, we can use the **cat** command, followed by the name of the file we want to open.

### 

\$ cat allowed.userlist

aron pwnmeow egotisticalsw admin

\$ cat allowed.userlist.passwd

root Supersecretpassword1 @BaASD&9032123sADS rKXM59ESxesUFHAd

## Foothold

After the credentials have been obtained, the next step is to check if they are used on the FTP service for elevated access or the webserver running on port 80 discovered during the nmap scan. Attempting to log in with any of the credentials on the FTP server returns error code 530 This FTP server is anonymous only. No luck here, so we can exit the FTP service shell.



However, we have one option left. During the nmap scan, the service running on port 80 was reported as Apache httpd 2.4.41, an Apache HTTP server. Typing in the IP address of the target into our browser's URL search bar results in this webpage. It seems to be a storefront for a server hosting company.



Reading about the target is helpful, but only at a surface level. In order to gain more insight into the technology they have used to create their website and possibly find any associated vulnerabilities, we can use a handy browser plug-in called <u>Wappalyzer</u>. This plug-in analyzes the web page's code and returns all the different technologies used to build it, such as the webserver type, JavaScript libraries, programming languages, and more. You can press the links below to add the plug-in to your browser of choice.

#### Add me to Chrome!

#### Add me to Firefox!

Once installed, you can access Wappalyzer by pressing on its' icon at the top right of the browser window. Below are the results for our current target.



From the output of Wappalyzer, we can note some of the more interesting items, specifically the PHP programming language used to build the web page. However, nothing gives us a direct plan of attack for now. Meanwhile, navigating around the page using the tabs and buttons provided on it leads us nowhere. Referencing previous write-ups, there is mention of a different, more direct way of navigating any hidden or hardly accessible directories and pages, and that is through dir busting. Using gobuster as our tool of choice, we can use the following switches for the script to get the fastest, most accurate results.

dir : Uses directory/file enumeration mode. --url : The target URL. --wordlist : Path to the wordlist. -x : File extension(s) to search for.

For the <u>-x</u> switch, we can specify php and html to filter out all the unnecessary clutter that does not interest us. PHP and HTML files will most commonly be pages. We might get lucky and find an administrative panel login page that could help us find leverage against the target in combination with the credentials we extracted from the FTP server.

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\$ gobuster dir --url http://{target\_IP}/ --wordlist /usr/share/wordlists/dirbuster
/directory-list-2.3-small.txt -x php,html

Gobuster v3.1.0 by OJ Reeves (@TheColonial)	& Christian Mehlmauer (@firefart)
<pre>[+] Url: [+] Method: [+] Threads: [+] Wordlist: [+] Negative Status codes: [+] User Agent: [+] Extensions: [+] Timeout:</pre>	<pre>http://{target_IP}/ GET 10 /usr/share/wordlists/dirbuster/directory-list-2.3-small.txt 404 gobuster/3.1.0 php,html 10s</pre>
2021/07/09 12:56:23 Starting	gobuster in directory enumeration mode
/index.html (Statu /login.php (Statu /assets (Statu /css (Statu /js (Statu /logout.php (Statu /config.php (Statu /fonts (Statu /dashboard (Statu	<pre>s: 200) [Size: 58565] s: 200) [Size: 1577] s: 301) [Size: 311] [&gt; http://{target_IP}/assets/] s: 301) [Size: 308] [&gt; http://{target_IP}/css/] s: 301) [Size: 307] [&gt; http://{target_IP}/js/] s: 302) [Size: 0] [&gt; login.php] s: 200) [Size: 0] s: 301) [Size: 310] [&gt; http://{target_IP}/fonts/] s: 301) [Size: 314] [&gt; http://{target_IP}/dashboard/]</pre>
 2021/07/09 13:22:08 Finished	

One of the most interesting files gobuster retrieved is the /login.php page. Navigating manually to the URL, in the form of <a href="http://{target\_IP}/login.php">http://{target\_IP}/login.php</a>, we are met with a login page asking for a username/password combination.

Username
Password
Remember me
Sign in

If the lists of credentials we found had been longer, we could have used a Metasploit module or a login brute-force script to run through combinations from both lists faster than manual labor. In this case, however, the lists are relatively small, allowing us to attempt logging in manually.

Please sign in		
admin		
•••••		
Remember me		
Sign in		

After attempting several username/password combinations, we manage to log in and are met with a Server Manager admin panel. Once here, an attacker could manipulate the website in whichever way they desired, causing havoc for the userbase and owners or extract more information that would assist them with gaining a foothold on the servers hosting the web page.



We successfully got the flag! It is displayed for us at the top of the admin panel.

Well done!